20. (Original) The medical data network of claim 19, wherein the applying instructions further comprise instructions for applying a contrast preprocessing function characterized by at least one of a GT, GA, GC, and GS preprocessing parameter.

REMARKS

The present application includes claims 1-20. Claims 1-20 were rejected. Claims 1, 7 and 14 are amended in response to Examiner's rejections. Claims 2, 9 and 16 are canceled. Claims 5, 10, 12, 17 and 19 are amended to correct the dependencies based on canceled claims 2, 9 and 16, respectively.

Claim 1 is amended to recite the additional limitation of storing predetermined preprocessing functions applicable to the raw image data, wherein said predetermined preprocessing functions include at least one of a frequency preprocessing function and a contrast preprocessing function. In addition, claim 1 is amended to recite the additional limitation of applying at least one and fewer than all of the preprocessing functions to the raw image data to form partially preprocessed raw image data, wherein at least one of said preprocessing functions is applied to said partially preprocessed raw image data at a workstation. Also, claim 1 is amended to recite the additional limitation of transmitting the partially preprocessed raw image data to a PACS network wherein said PACS network includes a preprocessing database and an image database, said preprocessing database utilized for storing said partially preprocessed raw image data, said image database utilized for storing a fully processed image data, wherein said fully preprocessed

image data is created by applying all of said preprocessing functions to said raw image data to form fully preprocessed image data. Claim 1 is additionally amended to recite the limitation of storing said partially preprocessed raw image data in said preprocessing database. Claims 7 and 14 are amended to recite the additional limitation of applying at least one and fewer than all of predetermined preprocessing functions to the raw image data to form partially preprocessed raw image data, wherein said predetermined preprocessing functions include at least one of a frequency preprocessing function and a contrast preprocessing function, wherein at least one of said preprocessing functions is applied to said partially preprocessed raw image data at a workstation.

Claims 1-3, 5, 7-10, 12, 14-17 and 19 were rejected under 35 U.S.C. § 102(a) as being anticipated by Huang, *PACS: Basic Principles and Applications*.

Claims 4, 6, 11, 13, 18 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Takeo et al., U.S. Patent No. 6,231,246.

The Applicant first turns to the rejection of claims 1-3, 5, 7-10, 12, 14-17 and 19 under 35 U.S.C. § 102(a) as being anticipated by Huang. Huang discloses a picture archiving and communication system ("PACS") that consists of image and data acquisition, a PACS controller and archive and display subsystems (Huang, Ch. 7.1). The image and data are generated by an imaging modality (Huang, Ch. 8.2). An acquisition gateway computer acquires the image and data from the imaging modality (Huang, Ch. 8.2). The PACS controller and archive acts as a database server and archive

system (Huang, Ch. 7.1.2). The display subsystems display the received images (Huang, Table 7.2).

The acquisition computer described in Huang converts the raw image data to PACS standard format and forwards this to the PACS controller or display workstations (Huang, Ch. 7.1.1). This conversion is the complete preprocessing of the image data (Huang, Ch. 8.7). The display workstations of Huang receive and display the fully preprocessed image data received from the PACS controller (Huang, Chs. 12.1 and 8.7). In addition, Huang discloses that all preprocessing functions are performed by the acquisition computer, and no preprocessing functions of the image data may be performed by the display workstations (Huang, Ch. 8.7). That is, the display workstations of Huang cannot perform any preprocessing of the image data. Conversely, the only functions the display workstations are able to perform is the processing of the image data, which is differentiated from the preprocessing of the image data by Huang (Huang, Ch. 12.3.1). The acquisition computer of Huang then forwards the fully preprocessed image data to either the PACS controller or display workstations (Huang, Ch. 7.1.1). The PACS controller of Huang acts as an image data archive for the fully preprocessed image data (Huang, Ch. 7.1.2). That is, the PACS controller archives the fully formatted data received from the acquisition computer (Huang, Table 7.1).

Huang does not teach storing predetermined preprocessing functions applicable to the raw image data, wherein said predetermined preprocessing functions include at least one of a frequency preprocessing function and a contrast preprocessing function. Rather,

Huang describes two categories of preprocessing functions: 1) image formatting

involving data format conversion (i.e., conversion from manufacturer format to DICOM)

and 2) preparation for optimal viewing at the display workstation (Huang, Ch. 8.7). With

regard to the preparation for optimal viewing, Huang discloses that the preprocessing

function should produce an image that has "proper size, good initial display parameters

(i.e., a suitable lookup table), and proper orientation; any distracting background should

be removed." (Huang, Ch. 8.7). However, Huang does not teach that the preprocessing

functions include at least one of a frequency preprocessing function and a contrast

preprocessing function.

Huang also does not teach applying at least one and fewer than all of the

preprocessing functions to the raw image data to form partially preprocessed raw image

data, wherein at least one of said preprocessing functions is applied to said partially

preprocessed raw image data at a workstation. Conversely, as described above, Huang

discloses that <u>all preprocessing functions are performed by the acquisition computer, and</u>

<u>no preprocessing functions of the image data may be performed by the display</u>

<u>workstations</u> (Huang, Chs. 8.7 and 12.3.1). That is, the only functions the display

workstations are able to perform is processing of the image data, which is differentiated

from the preprocessing of the image data (Huang, Chs. 8.7 and 12.3.1).

Huang also does not teach transmitting the partially preprocessed raw image data

to a PACS network wherein said PACS network includes a preprocessing database and

an image database, said preprocessing database utilized for storing said partially

preprocessed raw image data, said image database utilized for storing a fully processed image data, wherein said fully preprocessed image data is created by applying all of said preprocessing functions to said raw image data to form fully preprocessed image data. In addition, Huang does not teach storing said partially preprocessed raw image data in said preprocessing database. Instead, as described above, Huang describes sending the fully preprocessed image data to the PACS archive (Huang, Ch. 7.1.2). Since Huang does not teach the partial preprocessing of image data, Huang cannot teach the transmitting or storage of partially preprocessed image data.

Huang also does not teach applying at least one and fewer than all of the preprocessing functions to the raw image data to form partially preprocessed raw image data, wherein said predetermined preprocessing functions include at least one of a frequency preprocessing function and a contrast preprocessing function, wherein at least one of said preprocessing functions is applied to said partially preprocessed raw image data at a workstation. Conversely, as described above, Huang discloses that all preprocessing functions are performed by the acquisition computer, and no preprocessing functions of the image data may be performed by the display workstations (Huang, Chs. 8.7 and 12.3.1). The only functions the display workstations are able to perform is processing of the image data, which is differentiated from the preprocessing of the image data (Huang, Chs. 8.7 and 12.3.1).

The present rejection encompasses claims 1-3, 5, 7-10, 12, 14-17 and 19.

Independent claims 1, 7 and 14 are amended to recite limitations not taught by Huang.

Applicant respectfully submits that claims 1, 7 and 14 recite limitations not taught by

Huang. Consequently, the Applicant respectfully submits that independent claims 1, 7

and 14 and corresponding dependent claims 2-3, 5, 8-10, 12, 15-17 and 19 should be

allowable.

The Applicant next turns to the rejection of claims 4, 6, 11, 13, 18 and 20 under

35 U.S.C. § 103(a) as being unpatentable over Huang in view of Takeo. Takeo describes

a method and apparatus for reproducing an image via two image reproducing devices

wherein gradation and/or sharpness correction is performed for both images reproducing

devices. Specifically, Takeo describes a method and apparatus that receives an image

signal, applies a first processing condition to the image signal for display on a computer

screen, applies a second processing condition to the image signal for printing the image

on film, stores these two processing conditions, displays the image on the computer

screen and prints the image on film (col. 5, lines 64-68 and col. 6, lines 1-31). Takeo

therefore discloses applying a first processing condition so that the image signal will be

accurately displayed on a computer screen and applying a second processing condition to

the image signal so that the image signal will be accurately recorded onto film from a

laser printer (col. 5, lines 64-68 and col. 6, lines 1-31).

Takeo does not teach storing predetermined preprocessing functions applicable

to the raw image data, wherein said predetermined preprocessing functions include at

least one of a frequency preprocessing function and a contrast preprocessing function.

Rather, Takeo describes storing image processing conditions consisting of the gradation

characteristics of film and CRT display devices, including the gradation emphasis degree,

the type of gradation curve, the center of the rotation in the process of changing the

gradient, and the amount of shift in the gradation curve (col. 7, lines 18-23).

In addition, Takeo does not teach applying at least one and fewer than all of the

preprocessing functions to the raw image data to form partially preprocessed raw image

data, wherein at least one of said preprocessing functions is applied to said partially

preprocessed raw image data at a workstation. Conversely, as described above, Takeo

discloses the complete processing of the image data at the computer and does not disclose

any preprocessing of the image data whatsoever. That is, Takeo completely processes

image data for optimal viewing or printing and sends the fully processed image data

directly to the CRT device or the printer (col. 6, lines 32-49).

Takeo also does not teach transmitting the partially preprocessed raw image data

to a PACS network wherein said PACS network includes a preprocessing database and

an image database, said preprocessing database utilized for storing said partially

preprocessed raw image data, said image database utilized for storing a fully processed

image data, wherein said fully preprocessed image data is created by applying all of said

preprocessing functions to said raw image data to form fully preprocessed image data.

Takeo also does not teach storing said partially preprocessed image data in said

preprocessing database. Instead, Takeo describes the image processing means reading

the recorded image processing conditions from the storage means, the image processing

means then carrying out the image processing, then sending the processed image signal to

the CRT and the printer (col. 6, lines 1-49). That is, Takeo does not store the processed

image signal; instead, the image signal is sent directly to the CRT and the printer. In

addition, as there is no partial preprocessing of the image signal in Takeo (that is, as

described above, Takeo merely describes the full processing of an image to be displayed

on a CRT or printed on film (col. 6, lines 32-49)), Takeo does not teach storing said

partially preprocessed raw image data in said preprocessing database.

Takeo also does not teach applying at least one and fewer than all of

predetermined preprocessing functions to the raw image data to form partially

preprocessed raw image data, wherein said predetermined preprocessing functions

include at least one of a frequency preprocessing function and a contrast preprocessing

function, wherein at least one of said predetermined preprocessing functions is applied to

said partially preprocessed raw image data at a workstation. Conversely, as described

above, Takeo discloses the complete processing of the image data at the computer and

does not disclose any preprocessing of the image data whatsoever. That is, Takeo

completely processes image data for optimal viewing or printing (col. 6, lines 32-49).

Thus, the Applicant respectfully submits that Takeo does not teach or suggest

the limitations of the claimed invention.

As described above, Huang discloses a picture archiving and communication system ("PACS") that consists of image and data acquisition, a PACS controller and archive and display subsystems. Takeo does not remedy the shortcomings of Huang as discussed above, either alone or in combination. Assuming for the sake of argument that one would combine Huang and Takeo, the combination would result in an acquisition computer completely processing image data for display on a CRT and for printing on film and sending the completely processed image data to the CRT and the printer. However, the present invention discloses the partial preprocessing of image data at an acquisition computer where at least one additional preprocessing function is applied to the image data at a workstation. Thus, the combination of Huang and Takeo would not teach or suggest the limitations of the claimed invention.

The present rejection encompasses claims 4, 6, 11, 13, 18 and 20. Independent claims 1, 7 and 14 are amended to recite limitations not taught by either Huang or Takeo, taken alone or in combination. Thus, the Applicant respectfully submits that claims 1, 7 and 14 recite limitations not taught by either Huang or Takeo, alone or in combination. Consequently, the Applicant respectfully submits that claims 4, 6, 11, 13, 18 and 20, which depend from independent claims 1, 7 and 14, should be allowable.

Therefore, the Applicant respectfully submits that the claims of the present application should be allowable over the prior art.

Application No. 09/473,638
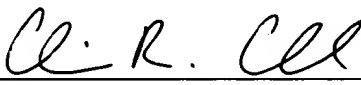Attorney Docket No. 15-IS-5286 (12522US01)

<u>CONCLUSION</u>

The Applicant respectfully submits that all claims of the present invention should

be in condition for allowance. If the Examiner has any questions or the Applicant can be

of any assistance, the Examiner is invited and encouraged to contact the Applicant at the

number below.

The Commissioner is authorized to charge any necessary fees or credit any

overpayment to the Deposit Account of GTC, Account No. 502401.

Respectfully submitted,

Date: December 16, 2003

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